

REMARKS

Favorable reconsideration of the application is respectfully requested in light of the amendments and remarks herein.

Upon entry of this amendment, claims 1–12 will be pending. By this amendment, claims 1, 4–5 and 8 have been amended, and claims 11–12 have been added. No new matter has been added.

§103 Rejection of Claims 1–10

In Section 3 of the Office Action, claims 1–10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ozkan *et al.* (U.S. Patent No. 6,055,270; hereinafter referred to as “Ozkan”) in view of Echeita *et al.* (U.S. Patent 6,078,958; hereinafter referred to as “Echeita”).

In the Background of the Specification, it was indicated, “[w]hen compressively encoding images for ... digital broadcast, high image quality must be maintained while [the] amount of compressively encoded data (a quantity of bits) is suppressed to at most a transmission capacity of the transmission channel. A technique called "statistical multiplexing" may be employed to transmit more programs to a transmission channel having a predetermined transmission capacity. The statistical multiplexing technique is a technique in which a code rate to be assigned to each program is dynamically changed so as to transmit more programs. In the statistical multiplexing technique, for example, by means of reducing the code rate with respect to the program in which deterioration of image quality is not noticeable even if the code rate thereof is reduced, it becomes possible to transmit more programs.” *Background of the Specification, page 1, line 22 to page 2, line 11.* Further, “[t]he statistical multiplexing technique uses the fact that portions (time) of the respective programs whose deteriorations of image

quality are conspicuous [do not usually] occur simultaneously.” *Background of the Specification, page 3, lines 7–10*. However, “in recent years, it is considered to transmit auxiliary data other than programs, including an EPG (Electric Program Guide), together with the programs. Fig. 3 shows an example of assigned code rates in the case where the programs and the auxiliary data are multiplexed to transmit. As shown in Fig. 3, the code rate assigned to each program is variably controlled by the statistical multiplexing technique, while the code rate assigned to the auxiliary data is always fixed.” *Background of the Specification, page 3, line 23 to page 4, line 5*. (emphasis added) Thus, “as a result of the code rate assigned to the auxiliary data being fixed in this manner, empty data are transmitted when the amount of the auxiliary data is small, so that there has been a problem that waste is much. Furthermore, even though improvement of image quality can be intended by increasing the code rate assigned to the program data when the amount of the auxiliary data is small, such assignment is not performed conventionally.” *Background of the Specification, page 3, lines 6–12*.

To solve the above-described problems regarding inefficient encoding of auxiliary data, embodiments of the present invention “provide a statistical multiplex system, a statistical multiplex controller and a method of statistical multiplex, whereby the assignments of the code rates are performed efficiently and the image quality can be improved.” *Specification, page 4, lines 16–19*.

For example, the structure of statistical multiplex system claim 1, as presented herein, includes at least:

a plurality of image encoding means for encoding a plurality of program data, each of which includes image data, and outputting the resultant;

at least one information encoding means for
acquiring an information encoding rate,
encoding auxiliary data other than the program data,
determining a target encoding rate for said auxiliary data, and
outputting the resulting encoded auxiliary data;

means for determining data remaining condition information
regarding said encoded auxiliary data;

data transmission command means for
acquiring said target encoding rate,
acquiring said data remaining condition information, and
determining said information encoding rate on the basis of said
target encoding rate and said data remaining condition
information;

multiplex means for multiplexing output data of each of the image
encoding means and the information encoding means; and

statistical multiplex control means for
setting a code rate for the information encoding means, the code
rate representing an amount of codes to be outputted per unit
time,
acquiring an encoding difficulty level which indicates a level of
difficulty in encoding for each program data, and
assigning code rates to each of the image encoding means on the
basis of the code rate for the information encoding means and
the encoding difficulty level.

(emphasis added)

Accordingly, in one aspect of claim 1, the statistical multiplex system includes at least
one information encoding means for acquiring an information encoding rate, encoding auxiliary
data other than the program data, determining a target encoding rate for the auxiliary data, and
outputting the resulting encoded auxiliary data; means for determining data remaining condition
information regarding the encoded auxiliary data; and data transmission command means for
acquiring the target encoding rate, acquiring the data remaining condition information, and

determining the information encoding rate on the basis of the target encoding rate and the data remaining condition information.

As to determining the information encoding rate, “[p]riority is given to setting the code rate for the information encoding means, and the code rates to be assigned to each of the image encoding means [are] set on the basis of the said code rate.” *Specification, page 6, lines 19–21.* The information encoding rate is determined by a data transmission command means, which is used to control the output of the information encoder. *See Specification, page 10, lines 12–14.* That is, “[t]he data transmission commander 65 receives the target value P of the bit rate transmitted from the information encoder 4, and further receives the data remaining condition F transmitted from the FIFO memory 61 for information. The data transmission commander 65, furthermore, on the basis of the target value P of the bit rate and the data remaining condition F, is set to determine the bit rate Rd of the encoded information signal Std to be outputted by the information encoder 4, so as to transmit the bit rate Rd to the information encoder 4.” *Specification, page 10, lines 14–21.* “[T]he reason why the data transmission commander 65 is set to control the output of the information encoder 4 is [that] there is a possibility that following data are inputted from the information encoder 4 while data still remain in the FIFO memory 61 for information (that is, before the FIFO memory 61 for information becomes "empty"), even though the data inputted to the FIFO memory 61 for information are, as a general rule, drawn out immediately and entirely by the multiplexer 62. Such being the case, the data transmission commander 65 is set to determine the bit rate Rd to be assigned to the information encoder 4 on the basis of the target value P of the bit rate transmitted from the information encoder 4 and the data remaining condition F of the FIFO memory 61 for information, in order not to cause overflow at the FIFO memory 61 for information and in order for the bit rate of the output data

from the multiplexer 62 not to exceed the transmitting capacity.” *Specification, page 10, line 22 to page 11, line 11.* (emphasis added)

By contrast, Ozkan does not teach or suggest the use of at least one information encoding means for acquiring an information encoding rate, encoding auxiliary data other than the program data, determining a target encoding rate for the auxiliary data, and outputting the resulting encoded auxiliary data; a means for determining data remaining condition information regarding the encoded auxiliary data; and a data transmission command means for acquiring the target encoding rate, acquiring the data remaining condition information, and determining the information encoding rate on the basis of the target encoding rate and the data remaining condition information. Because Ozkan does not disclose these limitations, Ozkan therefore fails to teach or suggest all the limitations of claim 1.

As to Echeita, the Office Action states, “Echeita teaches ... at least one information encoding means[,] multiplex means[,] and statistical multiplex control means.... *Office Action, page 3, lines 6–16* . Even assuming that Echeita discloses encoding means, multiplex means, and statistical multiplex control means, Echeita fails to teach or suggest the limitations to claim 1 regarding a data transmission command means discussed above. Therefore, since claim 1 should be allowable over Ozkan as discussed above, Ozkan and Echeita, individually or in combination, fail to teach or suggest all the limitations of claim 1.

Based on the foregoing discussion, claim 1 should be allowable over Ozkan and Echeita. Further, since independent claims 5 and 8 closely parallel claim 1 and recite similar limitations as recited therein, claims 5 and 8 should also be allowable over Ozkan and Echeita. Furthermore, since claims 2–4, 6–7 and 9–10 depend from claims 1, 5 and 8, respectively, claims 2–4, 6–7 and 9–10 should also be allowable over Ozkan and Echeita.

Accordingly, it is submitted that the rejection of claims 1–10 based upon 35 U.S.C. §103(a) have been overcome by the present remarks and withdrawal thereof is respectfully requested.

New Claims 11 and 12

Independent claims 11 and 12 are newly presented by this amendment and parallel and recite similar limitations as recited in independent claims 5 and 8. Based on the foregoing discussion regarding independent claims 5 and 8, claims 11 and 12 should also be allowable over the cited prior art reference.

Conclusion

In view of the foregoing, entry of this amendment, and the allowance of this application with claims 1–12 are respectfully solicited.

In regard to the claims amended herein and throughout the prosecution of this application, it is submitted that these claims, as originally presented, are patentably distinct over the prior art of record, and that these claims were in full compliance with the requirements of 35 U.S.C. §112. Changes that have been made to these claims were not made for the purpose of patentability within the meaning of 35 U.S.C. §§101, 102, 103 or 112. Rather, these changes were made simply for clarification and to round out the scope of protection to which Applicant is entitled.

In the event that additional cooperation in this case may be helpful to complete its prosecution, the Examiner is cordially invited to contact Applicant's representative at the telephone number written below.

The Commissioner is hereby authorized to charge any insufficient fees or credit any overpayment associated with the above-identified application to Deposit Account 50-0320.

Respectfully submitted,

FROMMER LAWRENCE & HAUG LLP



By: Charles E. Eggers, Reg. No. 56,343 for
William S. Frommer
Reg. No. 25,506
(212) 588-0800